

EXHIBIT A

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CiteXplore - citation details

7751520

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 **Pubmed id** 7751520**Title** **Structural investigations of the major allergen Phl p I on the complementary DNA and protein level.****Authors** [Petersen A](#), [Schramm G](#), [Bufer A](#), [Schlaak M](#), [Becker WM](#)**Affiliation** Division of Allergology, Forschungsinstitut Borstel, Germany.**Language** English**Journal** J. Allergy Clin. Immunol. (ISSN: 0091-6749) (ESSN: 1097-6825)

[1995 May; Volume: 95 (Issue: 5 Pt 1)] Page info: 987-94

Publication type Journal Article; Comparative Study;**Full text article****XML****Abstract**

Until now investigations of group I grass allergens have mainly been performed on ryegrass allergen (Lol p I). We studied this major allergen grass group with timothy grass pollen (Phl p I), a very common and important cause of type I allergy, to determine intraspecific and interspecific variations among different grass species. By immunoscreening a timothy grass pollen complementary DNA library we obtained three full-length clones. They revealed identical nucleotide sequences in the coding regions consisting of 262 amino acids, including a leader sequence of 23 amino acid residues. The comparison of our data with the amino acid sequences deduced from Lol p I and Hol 1 I clones showed sequence identities of greater than 85% and homologies of greater than 90%, indicating a high degree of sequence conservation. Despite the high degree of homology, amino acid differences were in immunodominant positions, which may be responsible for the differing immune response to group I allergens of different grass species.

ProteinsUniprot id [Q40967](#)

Name/Info Pollen allergen Phl pI precursor

Taxonomy Phleum pratense

Nucl. sequencesEMBL id [PPRPHLP1X](#)

Description P.pratense mRNA for pollen allergen PhIpI.

Seq Length 1152

Referenced by**Keywords (Mesh)****Chemicals**

Notice: This site will be replaced with beta.uniprot.org. Please send us [your feedback!](#)

UniProtKB Entry

PIR View



Niceprot View | SRS View

UniProtKB Entry: **Q40967**

ENTRY INFORMATION	
ENTRY NAME	Q40967_PHLPR New! View this entry in our Beta site
ACCESSION NUMBER	Q40967
Integrated into TrEMBL on	1996-11-01
Sequence was last modified on	1999-01-01 (Sequence version 2)
Annotations were last modified on	2007-09-11 (Entry version 42)
NAME AND ORIGIN OF THE PROTEIN	
PROTEIN NAME	Pollen allergen Phl pI precursor
GENE NAME	phlpI.p4
SOURCE ORGANISM	Phleum pratense
TAXONOMY ID	15957 [NCBI, NEWT]
LINEAGE	Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; BEP clade; Pooideae; Aveneae; Phleum
PROTEIN EXISTENCE	Evidence at transcript level
REFERENCES	
[1]	Petersen A; Schramm G; Bufe A; Schlaak M; Becker WM. Structural investigations of the major allergen Phl p I on the cDNA and protein level. 1995, <i>J. Allergy Clin. Immunol.</i> , 95, 987-994. Position: NUCLEOTIDE SEQUENCE. PubMed: 7751520; Medline: 95270847.
COMMENTS	
SIMILARITY	EA6; Belongs to the expansin family.
SIMILARITY	EA29; Contains 1 expansin-like CBD domain.
SIMILARITY	EA30; Contains 1 expansin-like EG45 domain.
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DATABASE CROSS-REFERENCES	
EMBL	Z27090,CAA81613.1,mRNA. [GenBank, DDBJ]
GENE3D	G3DSA:2.60.40.760,Expan_Lol_pI_C,1. G3DSA:2.40.40.40,Pollen_allergen,1.
GO	GO:0005576,C:extracellular region,IEA:InterPro. GO:0019953,P:sexual reproduction,IEA:InterPro.

	QuickGO
GRAMENE	Q40967 .
HSSP	P43213 , IN10 .
INTERPRO	IPR007112 , Expan_endogl . IPR007118 , Expan_Lol_pI . IPR007117 , Expan_Lol_pI_C . IPR005795 , LolPI . IPR014734 , Pollen_allergen . IPR005132 , RIpA .
PFAM	PF03330 , DPBB_1 ,1. PF01357 , Pollen_allerg_1 ,1.
PIR	S38620 , S38620 .
PRINTS	PR01225 , EXPANSNFAMILY . PR00829 , LOLP1ALLERGN .
PROSITE	PS50843 , EXPANSIN_CBD ,1. PS50842 , EXPANSIN_EG45 ,1.
SMR	Q40967 ,25-262.
UniRef	View cluster of proteins with at least 50% / 90% / 100% identity.
KEYWORDS	
Secreted; Signal	

FEATURES				
Feature	Description	Begin Position	End Position	Length
SIGNAL PEPTIDE	POTENTIAL	1	23	23
CHAIN	pollen allergen Phl pI / FTId= PRO_5000147467	24	263	240

Feature sequence (Put the mouse on the feature above to see the sequence below):

[IPKVPPGPNITATYGDKWLDAKSTWYGKPTAAGPKDNGGACGYKDVDKPPFSGM](#)

SEQUENCE	
LENGTH	263 aa
MOLECULAR WEIGHT	28203 Da
CRC64 CHECKSUM	06D5EC94675335C6
SEQUENCE	<pre> -----+-----+-----+-----+ MASSSSVLLV VALFAVFLGS AHGIPKVPPG PNITATYGDK WLDAKSTWYG 50 KPTAAGPKDN GGACGYKDVD KPPFSGMTGC GNTPIFKSGR GCGSCFEIKC 100 TKPEACSGEP VVVHITDDNE EPIAAYHFDL SGIAFGSMAS KGDEQKLRS 150 GEVEIQFRRV KCKYPEGTKV TFHVEKGSNP NYLALLVKFV AGDGDVVAVD 200 IKEKGKDKWI ALKESWGAIW RIDTPEVLKG PFTVRYTTEG GTKGEAKDVI 250 PEGWKADTAY ESK 263 </pre>

ADDITIONAL INFORMATION FROM iProClass		Go to iProClass
GENE/GENOME	NCBI GI#: g3901094	
BIBLIOGRAPHY	►View Bibliography Information ►Submit Bibliography PubMed: PMID: 7751520	
PIRSF FAMILY	PIRSF019642 major pollen allergen/expansion	
GENE ONTOLOGY	<i>Biological Process</i> GO: 0019953 : sexual reproduction [INTERPRO ; evidence: IEA] <i>Cellular Component</i> GO: 0005576 : extracellular region [INTERPRO ; evidence: IEA]	

STRUCTURE

PDB Similarity: [1BMW\(169-260,45.2%\)](#); [1WHO\(169-260,45.2%\)](#)

1BMW: [SCOP](#) [CATH](#) [FSSP](#) [MMDB](#) [PDBsum](#)

1WHO: [SCOP](#) [CATH](#) [FSSP](#) [MMDB](#) [PDBsum](#)

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General Information

Primary Accession # Z27090
Accession # Z27090
SRS Entry ID [EMBL:Z27090](#) (formerly *EMBL:PPRPHLP1X*)
Molecule Type linear mRNA
Sequence Length 1152
Entry Division PLN (*Plants*)
Entry Data Class STD (*Standard*)
Sequence Version Z27090.1
Creation Date 09-NOV-1993
Modification Date 18-APR-2005
EMBL-SVA [Z27090](#)

Description

Description P.pratense mRNA for pollen allergen PhlpI.
Keywords PhlpI; pollen allergen.;
Organism Phleum pratense (timothy grass)
Organism Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta;
Classification Magnoliophyta; Liliopsida; Poales; Poaceae; BEP clade; Pooideae; Aveneae; Phleum.

References

1. Petersen,A.; Schramm,G.; Bufer,G.; Schlaak,M.; Becker,W.M.;
Structural investigations of the major allergen Phl p I on the complementary DNA and protein level
J. Allergy Clin. Immunol. 95(5 Pt 1):987-994 (1995)
DOI [10.1016/S0091-6749\(95\)70099-4](#)
PubMed [7751520](#)  [CiteXplore](#)
Position 1-1149
2. Petersen,A.; Submitted (01-NOV-1993) to the EMBL/GenBank/DDBJ databases. Petersen A., Forschungsinstitut Borstel, Allergology, Parkallee 22, 23845 BORSTEL, Germany
Position 1-1149

Features

Key	Location	Qualifier	Value
<u>source</u>	1..1152	organism	Phleum pratense
		strain	agrostideae
		isolate	24W28-7c
		mol_type	mRNA
		clone_lib	cDNA/38/10/ZAP/6a
		clone	p4
		cell_line	Phleum pratense pollen/charge 24W28-7c
		db_xref	taxon:15957

5'utr 1..8
cds 9..800

gene phlpI.p4
product pollen allergen Phl pI
db_xref [GOA:Q40967](#)
db_xref [HSSP:P43213](#)
db_xref [InterPro:IPR005132](#)
db_xref [InterPro:IPR005795](#)
db_xref [InterPro:IPR007112](#)
db_xref [InterPro:IPR007117](#)
db_xref [InterPro:IPR007118](#)
db_xref [InterPro:IPR014734](#)
db_xref [UniProtKB/TrEMBL:Q40967](#)
protein_id [CAA81613.1](#)

translation

>CAA81613.1
MASSSSVLLVVALFAVFLGSAHGIPKVPPGPNITATYGDK
GGACGYKDVDKPPFSGMTGCGNTPIFKSGRGCGSCFEIKC
EPIAAYHFDLSGIAFGSMAKKGDEQKLRSAGEVEIQFRRV
NYLALLVKFVAGDGDVVAVDIKEKGKDKWIALKESWGAIW

sig_peptide 9..77
mat_peptide 78..797

gene phlpI.p4
gene phlpI.p4
product pollen allergen Phl pI
function unknown

3'utr 801..1152

Sequence

Characteristics

Length: 1152 BP, **A Count:**267, **C Count:**346, **G Count:**329, **T Count:**210, **Others Count:**0

Sequence

>embl|Z27090|Z27090 P.pratense mRNA for pollen allergen PhlpI.
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cgattatatcaa

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